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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/561,830 | 12/22/2005 | Ryotaro Hayashi | SHIGA7.040APC | 5909 |

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| EXAMINER |
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THOMPSON RUMMEL, PONDER N

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| ART UNIT | PAPER NUMBER |
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1795

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| NOTIFICATION DATE | DELIVERY MODE |
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07/18/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

| | | | |
|------------------------------|---|---------------------------------------|--|
| Office Action Summary | Application No. 10/561,830 | Applicant(s) HAYASHI ET AL. | |
| | Examiner PONDER N. THOMPSON RUMMEL | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 25 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7,8 and 12-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,8 and 12-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

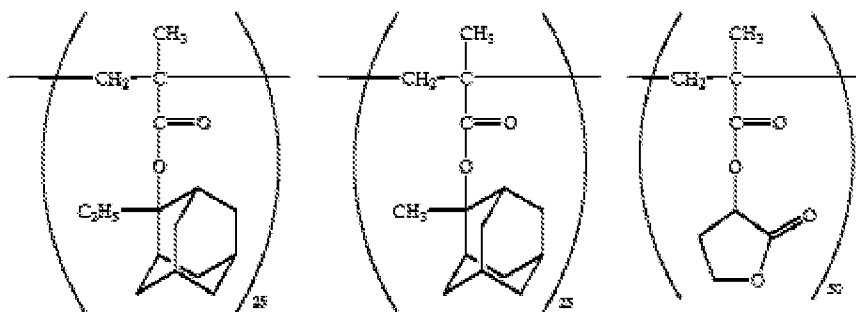
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5, 7, 8, 12-18 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujishima et al (US 6,239,231).

With respect to claims 1, 4, 5, 7, 8, 12-18 and 22, Fujishima et al discloses a positive resist composition comprising the copolymers as shown below (Resin I – Column 15, Synthesis Example 9 - Synthesis of Resin I):



The above resin comprises:

- 2-ethyl-2-adamantyl methacrylate, which meets the structural limitations of applicant's structural unit (a1)
- 2-methyl-2-adamantyl methacrylate, which meets the structural limitation of applicant's structural unit (a2);

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- α -Methacryloyloxy- γ -butyrolactone, which meets the structural limitation of applicant's structural unit (a3). The lactone is used in the amount of 50% of all the structural units (as shown above)
- an acid generator such as p-tolyldiphenylsulfonium trifluoromethanesulfonate (column 6, lines 54-67, columns 7 and 8, and column 17, line 33)
- a solvent such as mixed solvent of propylene glycol monomethyl ether acetate (PGMEA) and γ -butyrolactone (as used in Resin I - column 18, lines 60-67 and column 19, line 1)
- an amine (or quencher – column 8, lines 9-14)

The above copolymers are mixed together wherein the combination of 2-ethyl-2-adamantyl methacrylate (a1) and 2-methyl-2-adamantyl methacrylate (a2) account for 50% of the total of all structural units (See Resin I above).

Fujishima also disclose a method of patterning comprising:

- applying the resist on a substrate
- heat-treating or pre-baking the resist
- Exposing the resist (column 9, lines 16-24); and
- Post-Exposure baking and then developing to form a pattern. The PEB is done between 110° C (for resin I - see Table 2, Example 8)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al (US 6,239,231) in view of Iwai et al (US 2004/0110085).

With regards to claim 19, Fujishima et al discloses the positive resist as disclosed within claim 17 above, however, fails to the addition of a structural unit containing a hydroxyl group.

Iwai et al discloses a positive resist composition wherein a structure with a hydroxyl group is used within the amount of 20 to 40 mol % relative to the total amounts of structural units (paragraph [0100]). The addition of a hydroxyl group containing adamantyl group such as a 3-hydroxy-1-adamantyl (meth)acrylate improves dry etching resistance, verticalness of pattern cross section and resolution (paragraphs [0089] and [0092]). Therefore, it would have been obvious to one of ordinary skill within the art at the time of the invention to include a structural unit having a hydroxyl group as taught by Iwai within the positive resist composition of Fujishima to improve resolution, pattern cross-section and dry etching resistance.

5. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al (US 6,239,231) in view of Iwai et al (US 2004/0110085).

With regards to claim 19, Fujishima et al discloses the positive resist as disclosed within claim 17 above, however, fails to the addition of a structural unit containing an aliphatic polycyclic group containing no acid dissociable, dissolution inhibiting groups, lactones or hydroxyl groups.

Kodama et al discloses a positive photosensitive composition that comprises a repeating having a polycyclic hydrocarbon group such as (b3) (column 31) and (b21) (column 33). The addition of the polycyclic hydrocarbon group controls dry etching resistance and developing properties with alkali (column 31, lines 10-15). Therefore, it would have been obvious to one of ordinary skill within the art at the time of the invention to include a polycyclic hydrocarbon repeating unit as disclosed by Kodama et al within the positive resist composition of Fujishima to further control developing properties and dry etching resistance.

- 6.

Response to Arguments

7. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection. Fujishima et al discloses the composition of currently amended claim 1, wherein the composition comprises a 2-ethyl-2-adamantyl methacrylate and 2-methyl-2-adamantyl methacrylate, a lactone structural group, and

acid generator and a solvent. Further, Fujishima in view of Iwai discloses the addition of a structural adamantyl unit with a hydroxyl group.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **PONDER N. THOMPSON RUMMEL** whose telephone number is (571)272-9816. The examiner can normally be reached on Monday-Friday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. N. T./
Examiner, Art Unit 1795

/Cynthia H Kelly/
Supervisory Patent Examiner, Art Unit 1795